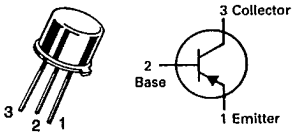
T-27-21

2N4234 thru 2N4236

CASE 79-04, STYLE 1
TO-39 (TO-205AD)



GENERAL PURPOSE TRANSISTORS

PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	2N4234	2N4235	2N4236	Unit
Collector-Emitter Voltage	V_{CEO}	40	60	80	Vdc
Collector-Base Voltage	V_{CBO}	40	60	80	Vdc
Emitter-Base Voltage	V_{EBO}		7.0		Vdc
Base Current	I_B		0.2		Vdc
Collector Current — Continuous	I_C		1.0 3.0*		Adc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D		1.0 5.7		Watt mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D		6.0 34		Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}		−65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	29	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage(1) (I_C = 100 mAdc, I_B = 0)	2N4234 2N4235 2N4236	$V_{CEO(sus)}$	40 60 80	— — —	Vdc
Collector Cutoff Current (V_{CE} = 30 Vdc, I_B = 0) (V_{CE} = 40 Vdc, I_B = 0) (V_{CE} = 60 Vdc, I_B = 0)	 2N4234 2N4235 2N4236	I_{CEO}	 — — —	 1.0 1.0 1.0	mAdc
Collector Cutoff Current (V_{CE} = 40 Vdc, V_{BE} = 1.5 Vdc) (V_{CE} = 60 Vdc, V_{BE} = 1.5 Vdc) (V_{CE} = 80 Vdc, V_{BE} = 1.5 Vdc) (V_{CE} = 30 Vdc, V_{BE} = 1.5 Vdc, T_C = 150°C) (V_{CE} = 40 Vdc, V_{BE} = 1.5 Vdc, T_C = 150°C) (V_{CE} = 60 Vdc, V_{BE} = 1.5 Vdc, T_C = 150°C)	 2N4234 2N4235 2N4236 2N4234 2N4235 2N4236	I_{CEX}	 — — — — — —	 0.1 0.1 0.1 1.0 1.0 1.0	mAdc
Collector Cutoff Current (V_{CB} = 40 Vdc, I_E = 0) (V_{CB} = 60 Vdc, I_E = 0) (V_{CB} = 80 Vdc, I_E = 0)	 2N4234 2N4235 2N4236	I_{CBO}	 — — —	 0.1 0.1 0.1	mAdc
Emitter Cutoff Current (V_{BE} = 7 Vdc, I_C = 0)		I_{EBO}	—	0.5	mAdc
ON CHARACTERISTICS					
DC Current Gain(1) (I_C = 100 mAdc, V_{CE} = 1.0 Vdc) (I_C = 250 mAdc, V_{CE} = 1.0 Vdc) (I_C = 500 mAdc, V_{CE} = 1.0 Vdc) (I_C = 1.0 Adc, V_{CE} = 1.0 Vdc)		h_{FE}	 40 30 20 10	 — 150 — —	—
Collector-Emitter Saturation Voltage(1) (I_C = 1.0 Adc, I_B = 125 mAdc)		$V_{CE(sat)}$	—	0.6	Vdc
Base-Emitter Saturation Voltage(1) (I_C = 1.0 Adc, I_B = 100 mAdc)		$V_{BE(sat)}$	—	1.5	Vdc
Base-Emitter On Voltage (I_C = 250 mAdc, V_{CE} = 1.0 Vdc)		V_{BE}	—	1.0	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product (I_C = 100 mAdc, V_{CE} = 10 Vdc, f = 1.0 MHz)		f_T	3.0	—	MHz

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ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)	C_{obo}	—	100	pF
Small-Signal Current Gain (I_C = 50 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	h_{fe}	25	—	—

(1) Pulse Test: PW ≤ 300 μs, Duty Cycle ≤ 2.0%.
*Indicates Data in addition to JEDEC Requirements.

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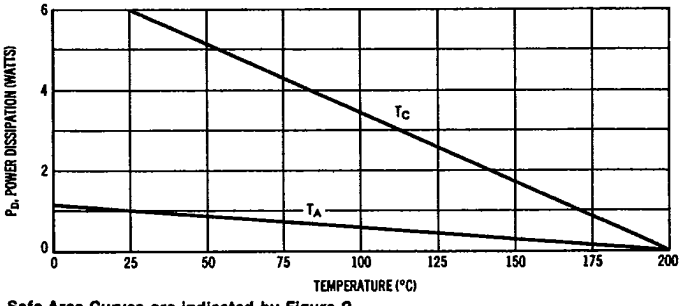
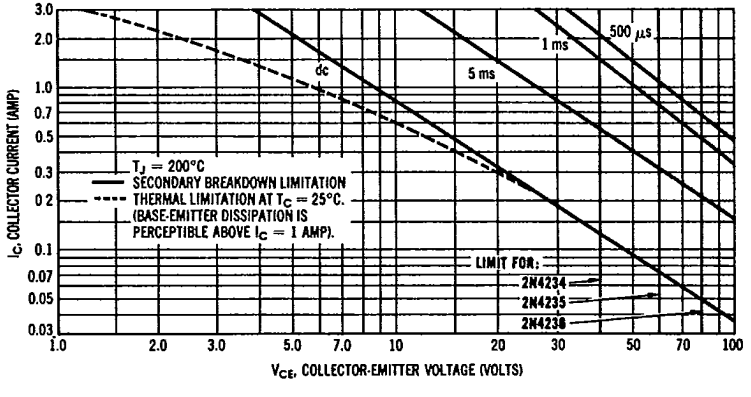
FIGURE 1 — POWER-TEMPERATURE DERATING CURVE



Safe Area Curves are indicated by Figure 2.
All limits are applicable and must be observed.

FIGURE 2 — ACTIVE-REGION SAFE OPERATING AREAS



The Safe Operating Area Curves indicate I_C — V_{CE} limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum T_J, power-temperature derating must be observed for both steady state and pulse power conditions.

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LARGE SIGNAL CHARACTERISTICS

FIGURE 3 — TRANSCONDUCTANCE

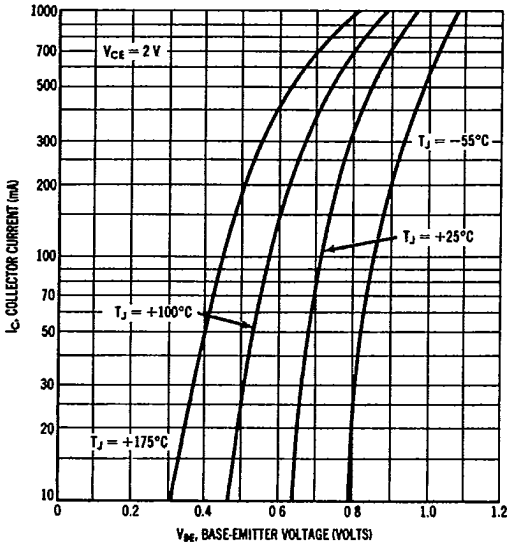
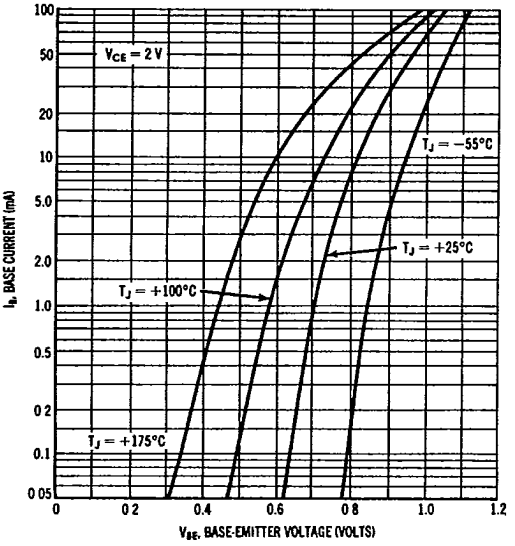


FIGURE 4 — INPUT ADMITTANCE



"OFF" REGION CHARACTERISTICS

FIGURE 5 — TRANSCONDUCTANCE

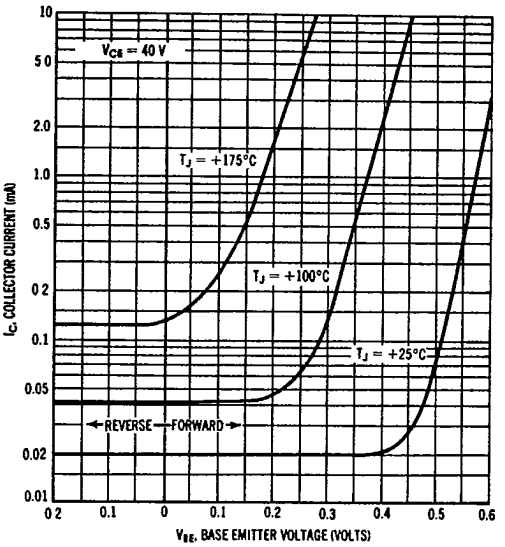


FIGURE 6 — EFFECTS OF BASE-EMITTER RESISTANCE

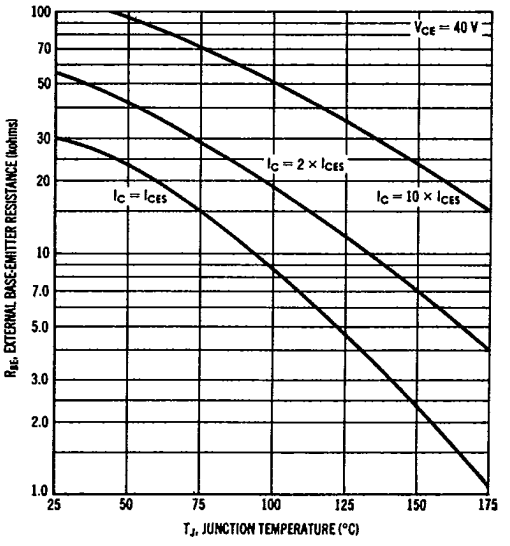


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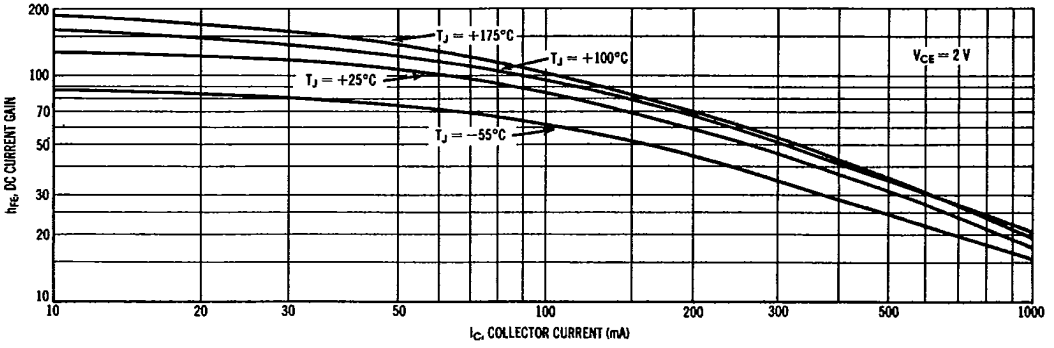
FIGURE 7 — CURRENT GAIN



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SATURATION REGION CHARACTERISTICS

FIGURE 8 — COLLECTOR SATURATION REGION

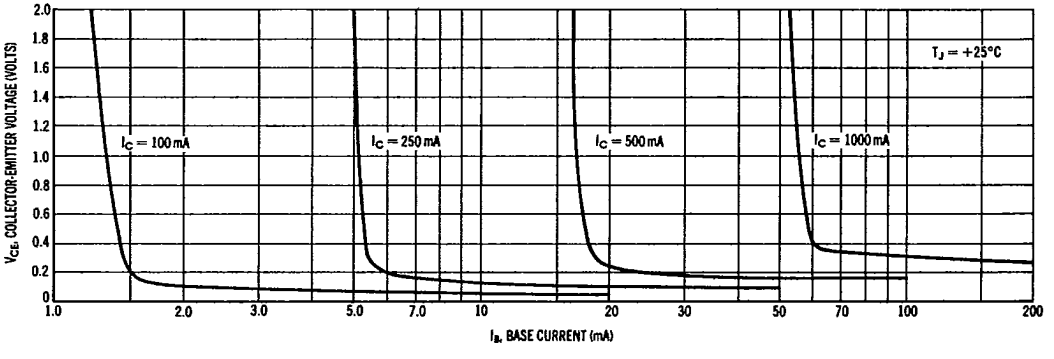

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FIGURE 9 — "ON" VOLTAGES

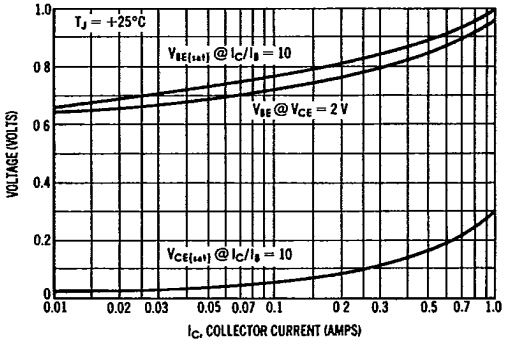


FIGURE 10 — TEMPERATURE COEFFICIENTS

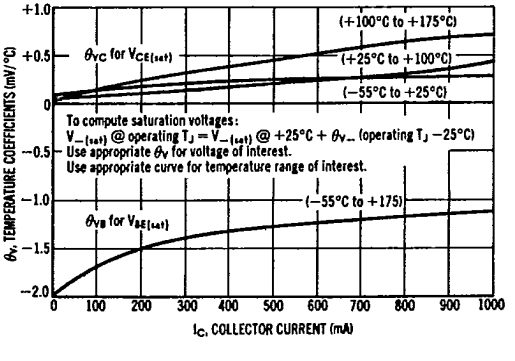

(+100°C to +175°C)
θ_{VC} for $V_{CE(sat)}$
(+25°C to +100°C)
(−55°C to +25°C)
To compute saturation voltages:
$V_{\_(sat)}$ @ operating $T_J = V_{\_(sat)}$ @ +25°C + $\theta_{V\_}$ (operating T_J −25°C)
Use appropriate θ_V for voltage of interest.
Use appropriate curve for temperature range of interest.
(−55°C to +175)
θ_{VB} for $V_{BE(sat)}$
θ_V, TEMPERATURE COEFFICIENTS (mV/°C)
I_C, COLLECTOR CURRENT (mA)

FIGURE 11 — TURN-ON TIME

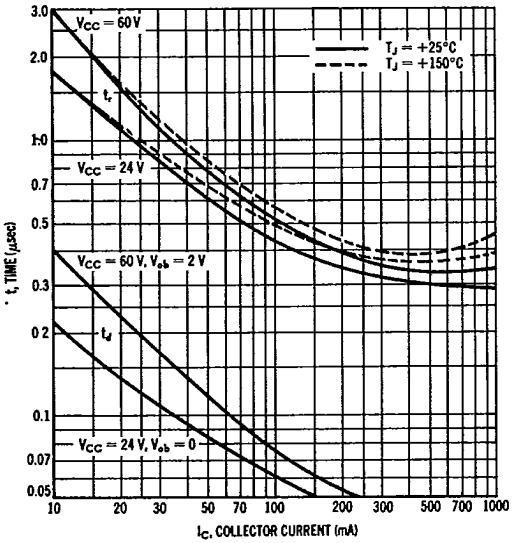


FIGURE 12 — STORAGE TIME

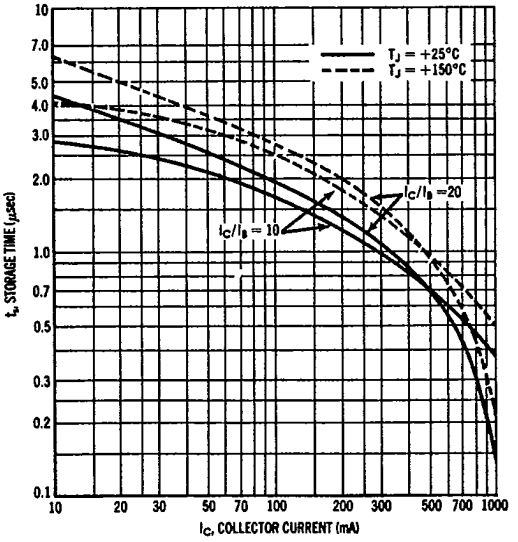


FIGURE 13 — CAPACITANCE

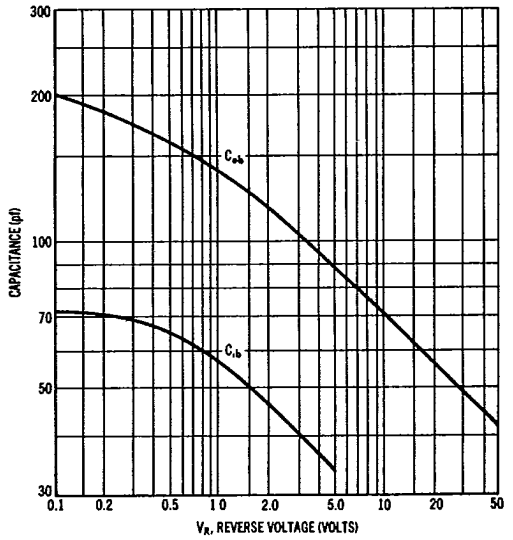
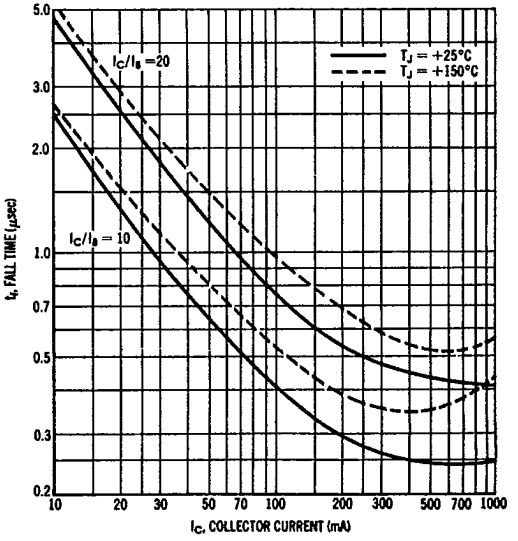


FIGURE 14 — FALL TIME



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